

IN THE CLAIMS

Presented below are all pending claims in marked up form or the status of claims that are no longer pending.

1. (Currently Amended) An optical tunable filters comprising:
a fixed mirror including a number of first erecting plates;
a movable mirror including a number of second erecting plates;
an air gap disposed between the fixed mirror and the movable mirror; and
an actuator reciprocating the movable mirror for changing the width of the air gap, wherein the actuator includes:
a moving unit, which is coupled to the moving mirror, having a first electrode;
a fixed unit, which is coupled to the fixed mirror, having a second electrode for generating an electrostatic force to pull the moving unit by reacting to the first electrode in order to control a gap between the moving unit and the fixed unit; and
an elastic member disposed between the fixed mirror and the movable mirror connecting the moving mirror and the moving unit for delivering kinetic force of the moving unit in an adjustable manner with a predetermined ratio in order to finely control the air gap between the fixed mirror and the moving mirror.
2. (Original) The optical tunable filter as recited in claim 1, wherein each of the erecting plates made of silicon (Si) has a thickness determined by an equation of $(2m + 1) \lambda / 4n$, and the air gap has a width determined by an equation of $(2m + 1) \lambda / 4$, n being a refraction index of silicon (Si) and m being 0 or a positive integer.
3. (Original) The optical tunable filter as recited in claim 1, wherein the movable mirror further includes an oxide layer formed below the second erecting plates and functioning as a sacrificial layer.

4. (Original) The optical tunable filter as recited in claim 1, wherein the actuator includes a fixed electrode and a movable electrode, the fixed electrode being mechanically connected to the movable electrode with an elastic member intervening therebetween and the movable electrode being mechanically coupled with the movable mirror.

5. (Original) The optical tunable filter as recited in claim 4, wherein the elastic member is a leaf spring made of silicon and a link lever intervenes between the leaf spring and the movable electrode for reducing displacement of the movable mirror.

6. (Currently Amended) An optical communication device for demultiplexing various wavelengths, comprising:

an input optical fiber;

a number of output optical fibers; and

an array of optical tunable filters, wherein each of the optical tunable filters is regularly arranged to correspond to one output optical fiber, each of the optical tunable filters including:

a fixed mirror including a number of first erecting plates;

a movable mirror including a number of second erecting plates;

an air gap disposed between the fixed mirror and the movable; and

an actuator reciprocating the movable mirror for changing the width of the air gap, wherein the actuator has:

a moving unit, which is coupled to the moving mirror, having a first electrode;

a fixed unit, which is coupled to the fixed mirror, having a second electrode for generating an electrostatic force to pull the moving unit by reacting to the first electrode in order to control a gap between the moving unit and the fixed unit; and

an elastic member disposed between the fixed mirror and the moveable mirror connecting the moving mirror and the moving unit for delivering kinetic force of the moving unit in an adjustable

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manner with a predetermined ratio in order to finely control the air gap between the fixed mirror and the moving mirror.

7. (Currently Amended) An optical communication device for multiplexing various wavelengths, comprising:
- a number of input optical fibers;
 - an output optical fiber; and
 - an array of optical tunable filters, wherein each of the optical tunable filters is regularly arranged to correspond to one input optical fiber, each of the optical tunable filters including:
 - a fixed mirror including a number of first erecting plates;
 - a movable mirror including a number of second erecting plates;
 - an air gap disposed between the fixed mirror and the movable mirror;
 - and
 - an actuator reciprocating the movable mirror for changing the width of the air gap, wherein the actuator has:
 - a moving unit, which is coupled to the moving mirror, having a first electrode;
 - a fixed unit, which is coupled to the fixed mirror, having a second electrode for generating an electrostatic force to pull the moving unit by reacting to the first electrode in order to control a gap between the moving unit and the fixed unit; and
- an elastic member disposed between the fixed mirror and the movable mirror connecting the moving mirror and the moving unit for delivering kinetic force of the moving unit in an adjustable manner with a predetermined ratio in order to finely control the air gap between the fixed mirror and the moving mirror.